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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,298	03/01/2004	Khoi A. Phan	H0266 / AMDP812US	9262

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EXAMINER	
LE, THAO X	
ART UNIT	PAPER NUMBER
2814	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,298	PHAN ET AL.	
	Examiner	Art Unit	
	Thao X. Le	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2006*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,23 and 25-34* is/are pending in the application.

4a) Of the above claim(s) *28-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,23,25-27 and 32-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on ___ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-7, 23, 25-26, and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6098408 to Levinson et al. in view of US 6729383 to Cannell et al.

Regarding claims 1and 34, Levinson discloses in fig. 2 a heat regulating device for regulating a heat flow into and out of an integrated circuit semiconductor body comprising: a plurality of thermo-electrical structures 30, column 4 line 47, that creates a uniform temperature gradient across an integrated circuit semiconductor body via heat

inducement to and/or dissipation of generated heat away from a portion of the integrated circuit semiconductor body (a semiconductor wafer would inherently include a IC such as transistor, capacitor, interconnections, etc..), col. 8 line 56, and at least one layer of a conductive material 20, col. 4 line 35, in contact with the thermo-electrical structure 30 for conducting heat flow.

But, Levinson does not disclose a heat regulating device wherein the thermoelectric structure has a structure with a distribution line patterns that is a denser towards center of the structure and a less dense towards outer edges the structure.

However, Cannel a heat dissipating structure can be formed in various arrangements, col. 2 lines 49-57. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the teaching of Cannell with Levinson as claimed, because such rearrangement of parts was held to have been obvious. In re Japikse 86 USPQ 70 (CCPA 1950). In addition, the Applicant has no support data, which convinces that the particular claimed configuration is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing better heat distribution and for better mating surfaces. In re Dailey 149 USPQ 47, 50 (CCPA 1966). See also Glue Co. v. Upton 97 US 3,24 (USSC 1878).

The recitation of 'that creates a uniform temperature gradient across an integrated circuit semiconductor body via heat inducement to and/or dissipation

of generated heat away from a portion of the integrated circuit semiconductor body' is only a statement of the inherent properties of the product. The structure recited in Levinson is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claim 2, Levinson discloses the heat regulating device wherein the thermo-electrical structure 30 is trough within the body of the layer of the conductive material 20, fig. 2.

Regarding claims 3-6, Levinson discloses the heat regulating device further comprising a plurality of the thermo-electrical structures 30 connected form a spreading assembly, fig. 2, wherein the spreading assembly is operatively connected to a heat sink, fig. 10, wherein the thermo-electrical structure 30 is a conductive pathway for heat transfer, wherein the thermo-electrical structure 30 has a structure selected from a group comprising of maze-shaped structure, fig. 2.

Regarding claim 7, Levinson discloses a heat regulating device for regulating a heat flow of an integrated circuit comprising: means TC', fig. 10, for inducing heat into a portion of a semiconductor body of the integrated circuit 180 utilizing a plurality thermo-electric structures 30, fig. 20, or a means TC' for dissipating heat away from the portion of the semiconductor region of a semiconductor body of the integrated circuit (a

semiconductor wafer would inherently include IC structure such as transistor, capacitor, interconnection, etc..) utilizing a plurality of thermo-electric structure 30; the heat inducing means and or/heat dissipating means create a uniform temperature gradient across the semiconductor body ; and heat conducting means 20 in contact with the means 30 for inducing heat into or dissipating heat away from the portion of the semiconductor body of the integrated circuit.

But, Levinson does not disclose a heat regulating device wherein the thermoelectric structure has a structure with a distribution line patterns that is a denser towards center of the structure and a less dense towards outer edges the structure.

However, Cannel a heat dissipating structure can be formed in various arrangements, col. 2 lines 49-57. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the teaching of Cannell with Levinson as claimed, because such rearrangement of parts was held to have been obvious. In re Japikse 86 USPQ 70 (CCPA 1950). In addition, the Applicant has no support data, which convinces that the particular claimed configuration is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing better heat distribution and for better mating surfaces. In re Dailey 149 USPQ 47, 50 (CCPA 1966). See also Glue Co. v. Upton 97 US 3,24 (USSC 1878).

The recitation of 'that creates a uniform temperature gradient across an integrated circuit semiconductor body via heat inducement to and/or dissipation of generated heat away from a portion of the integrated circuit semiconductor body' is only a statement of the inherent properties of the product. The structure recited in Levinson is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claims 23, 25-26, Levinson discloses the heat regulating device with components 42, col. 4 line 54, embedded into the spreading assembly to manage the heat flow away from and/or into the portion of the semiconductor body of the integrated circuit, fig. 10, wherein the thermo-electrical structure being embedded with measuring device to measure various physical properties of the portion of the semiconductor body of the integrated circuit, fig. 10, wherein the thermo-electrical structure 30 being external element attached to the surface of the heat regulating device, fig. 2.

Regarding claim 32, Levinson discloses a heat regulating device wherein the thermo-electrical structure 30 is a composite, col. 4 line 55, composed of a layer having at least one part tailored to a heat-generating characteristic of a portion of the integrated circuit semiconductor body.

Regarding claim 33, Levinson discloses a heat regulating device at least one thermo-electric structure 30 is integrated with the semiconductor body such that the thermo-electrical structure is positioned in a region of the semiconductor body where a hot spot (IC would generate heat) is anticipated, fig. 10.

4. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6098408 to Levinson et al. and of US 6729383 to Cannell et al. as applied to claim 1 above and further in view of US 6105381 to Ghoshal.

Regarding claim 27, Levinson does disclose a heat regulating device fabricated from a combination of various layers of ceramic 48, col. 4 line 58.

But Levinson does not disclose a heat regulating device fabricated from a combination of various layers of silicon carbide and diamond.

However, Ghoshal discloses a thermo electro deice 454 connects to a diamond, col. 5 lines 38-40. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to replace the ceramic material of Levinson with the diamond layer teaching of Ghoshal, because it would have created a high thermal conductivity material as taught by Ghoshal, col. 5 line 40.

Response to Arguments

5. Applicant's arguments filed on 11/27/06 have been fully considered but they are not persuasive. The particular arrangement of the thermoelectric structure as claimed is discussed in claim 1 that the rearrangement of parts was held to have been obvious. In re Japikse 86 USPQ 70 (CCPA 1950). In addition, the Applicant has no support data, which convinces that the particular claimed configuration is significant or is anything

more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing better heat distribution and for better mating surfaces. In re Dailey 149 USPQ 47, 50 (CCPA 1966). See also Glue Co. v. Upton 97 US 3,24 (USSC 1878). Furthermore, various shape and size of thermoelectric structure has been disclosed in various patents such as in US 7164077, col. 4 lines 35-40, US 6739138, fig. 4a-4c, US PUB 2003/0097845, fig. 4D-4G, US 6727422, fig. 9A-10.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

20 Jan. 2007

THAO X. LE
PRIMARY PATENT EXAMINER